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TEACHING READING TO CHILDREN WITH LOW MA'S.

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ONE OF THE PROBLEMS OF TEACHING READING TO CHILDREN WITH LOW MENTAL AGES, FOR EXAMPLE, OF FOUR TO FIVE, IS THAT MOST READING PROGRAMS ARE GEARED TO THE CHILDREN WITH A MENTAL AGE OF ABOUT SIX AND ONE-HALF. A CHILD WITH THIS HIGHER MENTAL DEVELOPMENT WILL OFTEN HAVE MANY OF THE BASIC READING SKILLS ALREADY ACCOMPLISHED, OR HE CAN LEARN THEM QUICKLY AND WITHOUT THE BENEFIT OF THE MOST EFFICIENT INSTRUCTION. A CHILD WITH A LOW MENTAL-AGE MIGHT STRUGGLE TO LEARN TO READ UNDER SUCH A PROGRAM FOR AN INORDINATE AMOUNT OF TIME. RETARDED, HANDICAPPED, AND DEPRIVED CHILDREN MUST GENERALLY BE INSTRUCTED IN THE MOST BASIC READING SKILLS. THEY MUST BE SHOWN THAT EACH LETTER REPRESENTS A SOUND. THEY MUST THEN BE TAUGHT THAT THESE SOUNDS ARE SEQUENCED IN A WORD IN TIME. THAT IS, THEY MUST LEARN HOW TO BLEND. RHYMING AND ALLITERATION TASKS ARE USEFUL IN TEACHING BLENDING SKILLS. IN DEVELOPING THIS SOUND-SEQUENCE SKILL, CONTINUOUS-SOUND WORDS LIKE "FAN" AND "RAN" SHOULD BE INTRODUCED BEFORE STOP-SOUND WORDS LIKE "CAT" AND "RAT." WORDS WHOSE PRONUNCIATION DOES NOT FIT THE FUNDAMENTAL SOUND-SEQUENCE APPROACH, FOR EXAMPLE, "HAVE," IN WHICH THE "E" IS NOT PRONOUNCED, AND "SHE," WHICH CONTAINS A DOUBLE LETTER SOUND, ARE CALLED IRREGULAR WORDS AND ARE TO BE INTRODUCED LAST. INSTRUCTION SHOULD BE UNIFORM FOR ALL PUPILS. (WO)

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Teaching Reading to Children with Low MA's

Siegfried Engelmann

Little progress has been made in developing effective reading instruction for children with low mental ages, that is for children whose mental age is below 6 1/2 years. In fact, little progress has been made in developing effective approaches for school-age children with average MA's (mental ages). Although the average child learns to read, he doesn't usually learn very quickly, and some average children have extreme difficulties, although they are intelligent and seem to have the mental equipment necessary to read.

Why does this situation exist? The answer seems to be that the authors of reading programs have typically approached the problem of teaching children to read in an awkward way. They have worked with average children of about 6 1/2 years. These children are relatively sophisticated. They have a pretty good idea of what reading is, and they know what they are supposed to do in a new-learning situation. They know how to treat words as sounds andnot merely as signals that convey content. They play word games; they rhyme and alliterate. They probably know letter names and have a fair idea of some letter sounds. These children are able to "learn" to read from a variety of approaches, which implies that they are able to compensate for gaps in an instructional program. They often learn in spite of the program. If the program does not provide

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adequate instruction for a particular sub-skill, such as rhyming or blending, the children usually learn anyhow. When the author of a beginning reading approach works with such children, he cannot clearly see the relationship between the effectiveness of his program and the children's reading performance. He cannot clearly see which skills he has successfully taught, which skills were taught before the child began the program, and which were obliquely induced through instruction. In other words, the author cannot refer to the performance of the children after they have received instruction and specify how much of it he is responsible for and how much of it is accounted for by home and previous training. Typically, he presumes that he is responsible for a great deal more than he deserves credit for. But since most of the children learn to read, it is difficult to discredit his presumption. For example, he may introduce exercises that are presumed to teach comprehension. He can refer to most of the children in the class who have received the instruction and notethat they do comprehend. He may then conclude that his exercises were a success. But it is quite possible that these children would have comprehended well without the instruction he provided; it may be that their performance is not clearly a function of the instruction they have received. The author may justify readiness exercises in a similar manner, noting that the children who receive the instruction are ready. However, much of the readiness training may be quite irrelevant to the problems

associated with learning to read. If one provides a broad enough scope of tasks, he will undoubtedly hit upon some tasks that actually do prepare the child, but in the process, he may provide many tasks that do little.

When the author works with children who may have mastered skills that are necessary to read, there are relatively few checks on his imagination. He may identify skills that are basically irrelevant to the act of translating those clusters of squiggles on the printed page into word sounds, and he may fail to identify sub-skills that are crucial to the translation process. It may be difficult for us to demonstrate possible weaknesses in his program for the simple reason that most of the children who receive instruction perform well. We may point out that a certain number of children who receive the instruction do not perform well, but the author is not usually compelled to take responsibility for these children. These children can be viewed in two ways, either as children who fail because they have not received adequate instruction, or as children who fail because they lack aptitude, readiness, or intelligence. By attributing their failure to a lack of aptitude rather than a lack of appropriate instruction, the author can write them off, maintaining that his program is designed for "average" children. There is a certain appeal to this argument. Children do vary in aptitude, as any teacher knows, and it seems reasonable that not all can learn from a given approach. The danger in this argument, however, is that

it leaves the author unbridled. He is provided with a floating standard. If the children succeed, the program is responsible; if they fail, the children are responsible. The instruction is exonerated from all responsibility for failure. Obviously, this situation is not healthy and does not promote better instruction. Rather, it encourages post-hoc justification of what happened, with no fixed standard against which tomeasure the effectiveness of various approaches.

There have been comparisons of different reading approaches, but such comparisons do not tell us precisely where a given program is strong or weak, and they do not effectively discredit the approach that is relatively poor by comparison with others. The author of an approach that does not do well in comparative studies may contend that his program achieves objectives that are not measured or taken into consideration in the comparison, such as an appreciation of reading. The act of reading is so broad and involved that it may be difficult to demonstrate that he is mistaken.

Solving the Problem

To solve the problem of providing better reading instruction for children who may have trouble with traditional approaches (including preschool children and mentally retarded children) we must identify the various trouble spots encountered by those children in learning to read. Obviously, we cannot do this by working with children that are more sophisticated

because such children often don't encounter the severe difficulties that the children with less reading aptitude encounter. Children that are more sophisticated, therefore, don't provide the kind of feedback that is necessary to identify the primary problems in learning to read. An analysis of the reading code provides important information about what is involved in reading, but it doesn't tell which skills are relatively difficult to learn and which are easy. The only way one discovers what the central problems are is to work with children who have low MA's. These are ideal subjects for developing solid instructional approaches for these reasons:

1. They learn slowly, which means that the method developer can observe the problems they encounter in some detail.

2. They probably have not learned or even partially learned the key sub-skills in reading outside of the instructional setting, which means that if they learn to handle a particular sub-skill, we can credit the instruction with their learning.

The method developer who works with low MA children is less likely to use a floating standard, less likely to say that those children who fail lack aptitude. <u>All of his subjects lack aptitude</u> (as compared with more sophisticated children); therefore, he is in a better position to accept the idea that if the children fail, the instruction has failed, and if they learn, the instruction has succeeded. This attitude is

potentially productive because it allows the method developer to look at each segment of reading behavior and see whether or not he can teach it. It is difficult to evaluate an approach by looking at it as a whole. An approach is more productively viewed as a series of components, each of which can be separately evaluated--each of which can be improved. This kind of evaluation assumes that we clearly understand what the components are. The best way to find out is to work with the children who will "tell us" through their performance. The slow-learning child does this. When he comes to a gap in instruction, he doesn't merely pause before working through the gap. He stops and he may remain stopped for weeks. His performance tells the curriculum designer when a technique works and when it doesn't work. The performance of the more sophisticated child does not.

A New Reading Program for the Bereiter-Engelmann Preschool

The reading program that we are currently using in the Bereiter-Engelmann preschool certainly does not represent the ultimate in reading instruction, but I feel that it represents a good first start. The program was developed by working with preschool children. Some were culturally deprived children (with entering Stanford-Binet IQ's of about 91). Others were middle-class children (with entering IQ's of about 113). All were four years old. After 48 hours of classroom instruction the culturally disadvantaged children read on the 1.25 grade

level (Wide Range Achievement scores) and the middle-class children read on the 2.3 grade level. Another group of disadvantaged children who received instruction for two school years, read on the 2.6 grade level at the end of their kindergarten year. Not one child read below the 1.6 grade level, although some of these children wouldn't be expected to read by the second or third grade if they had received traditional instruction.

While our work has been primarily focused on culturally disadvantaged children, it has implications for teaching reading to mentally retarded children. The reasons are:

1. Over one third of the disadvantaged children we work with have entering IQ's in the 80's, which place them on the fringe of the mentally handicapped.

2. Typically, the IQ's of four- and five-year-old children with IQ's in the 80's will drop as the children get older, which means that these children are potentially mentally handicapped at four.

3. The mental age of these children is as low as many children in special classes. An eight-year-old child who has an IQ of 75 has a mental age of six years. The initial mental age of the disadvantaged children we work with is less than four years. This means that many of the children we have taught to read have less knowledge of the world and fewer skills than children who do not learn to read in special classes.

4. The younger child is often more difficult to teach

than an older child with the same mental age because the younger child is generally more difficult to motivate, has a shorter interest span, and knows less about the type of classroom behavior that is expected of him.

The approach that we use, in other words, should work with all children who have MA's of four and above, whether they are classified as mentally retarded children, culturally deprived children, or gifted children.

The Method

Our motto in trying to work out a successful reading approach was simply, "keep the baloney out of the program." We analyzed the reading code, not as the linguist or the educator typically analyzes it; we tried to determine what kind of behavior is demanded of the children, asking ourselves, "What must they be able to do?" Next we tried to develop tasks that teach them the appropriate behavior. And finally, we tried to remain sensitive to the children's reaction to the presentations. If they stalled and failed to learn a skill, such as blending, we tried to make the "rule" for blending more obvious so that the children could see more clearly what they were expected to do. If various approaches seemed to make little difference in the children's progress, we used the approach that seemed most economical and manageable, but we did not close the book on the issue. We recognized that it may be possible tosupplant the drill with an approach that is far superior.

The children were taught in small groups--averaging about five children each. Children were grouped homogeneously, according to performance in the classroom. The method of instruction demanded a great many responses from the children, so that the teacher received maximum feedback and the children received maximum corrected practice. Each daily reading period lasted 15-20 minutes. And the goal of instruction was to pack as much learning into these periods as possible.

We were particularly interested in identifying the places at which the children encountered difficulties. The first stumbling block encountered by our low-MA children is in learning that the letters in a word stand for sounds that are sequenced in time. When a person says the word Batman some of the parts occur before other parts, and the order of the parts (or sound elements) is fixed. The words manbat or tabman are not the same as batman, because in these words, the order of parts has been violated. The instruction must therefore teach the naive child

a. that the spoken word is composed of parts;
b. that the parts occur in a fixed order in time;
c. that the reading code represents the passage of time through a left-to-right progression of symbols.

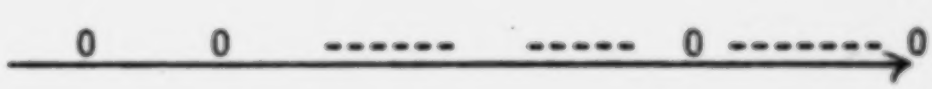
To teach the child to focus on parts of words, the teacher introduces rhyming and alliteration tasks. In rhyming, the child must hold part of the word constant (the ending) and vary the other part. "Okay, I want to hear some words that rhyme with superman. ... Here's one: boo--perman. Here's

another: foo--perman. And another: moo--..." To teach alliteration (in which the beginning part stays the same and the ending changes) the teacher says, "I want some words that start out the same way as, "SSSS-uper. Here's one: SSSS-ister. Another: SSSS-ee. Another: SSSS--..."

If the child has not mastered rhyming and alliteration skills, he will probably have an extremely difficult time reading. Specifically, he'll have difficulty understanding how similar words are similar. Similar words are similar because part of one word is the same (makes the same sound) as a part of the others. If the child cannot hear the way in which car is the same as far--he is not in a very good position to look for the sameness in the orthography of the two words.

To teach the children the rule for mapping the passing of time from left to right, the teacher begins by demonstrating how to sequence events from left to right. The teacher claps her hands together and follows this action by tapping herself on the head with one hand. "I'm doing it the right way," she says, and invites the children to do it with her, pausing between each trial. After the children have produced the pair of actions a number of times, the teacher says, "My turn. Watch me and tell me if I'm doing it the right way." She then produces the actions either in the correct or the reverse order. "Did I do it the right way?" Not all children will be able to see the difference. Some will insist that the sequence head tap--hand clap is the "right way."

After the teacher has made the children aware of the "right way," using a variety of examples, she symbolizes the actions and presents them on the chalkboard from left to right. For the hand clap she uses this symbol:---- (demonstrating how it is formed by holding her hands at the ends of the line and bringing them together in a clap); for the head tap, she introduces this symbol: O. She draws an arrow on the board pointing from left to right. She claps her hand and makes the corresponding symbol, -------, at the tail of the arrow. "I'm drawing a picture of what I did." She then follows with the head tap, and makes the symbol for it near the head of the arrow. She asks the children to read what happened. "Start here and go with the arrow." After demonstrating how the code works, she presents a series of examples in which the children are asked to do what the symbols tell them to do. For example, she may present the following series and have the children "read" it and do what it says--



As the children become increasingly proficient in working with the code, she can introduce other symbols and introduce more difficult tasks, such as having a child symbolize a series of events that is produced either by the teacher or by another child.

As the children are learning the rules for translating events that occur in time onto space, they are also introduced

to the conventional sound symbols used in reading. Initially, the following sounds are presented ă, ŏ, e, m, f, r, s, n. There is no particular difficulty involved in teaching these. Young disadvantaged and retarded children learn the symbol slowly, but they succeed in time. The teacher should be careful not to overload the children by presenting too many examples. She must also be careful not to present the same "objects" unless she wants to induce mislearning. She must present many different examples of each letter, as it appears on cards and on the chalkboard in different colors and different sizes. All letters are presented as sounds; a is identified as the short-a sound (and); f is the unvoiced sound that occurs at the beginning of such words as fan.

These initial letters are selected not on the basis of frequency of occurrance or on the basis of "linguistic" considerations; rather they are selected on the basis of specific difficulties the low-MA child has in learning to read. Stated differently, they are selected because they allow for the most precise demonstrating of the relationship between the unblended word and the blended word. Typically, the disadvantaged child and the retarded child have trouble learning to blend. One can walk into virtually any third grade class for disadvantaged children and note many children making the same type of error. They can sound out a word such as cat, saying, "Cu-ah-tu." But they cannot put the pieces together to form a word. When asked, "What word is that?" they either shrug or repeat,

"Cu-ah-tu." Their failure to see the similarity between "cu-ah-tu," and "cat" is not without cause. The relationship between "cu-ah-tu" and "cat" is not particularly obvious. The parts of the unblended word are separated by pauses in time; the parts of the blended word are not. There are sounds in the unblended word that do not appear in the blended word. The relationship between blended and unblended words can be made more obvious by the following method:

1. <u>the teacher introduces only those words that begin with a continuous sound, not a stop sound</u>. Such words as <u>cat</u> are not introduced. Such words as <u>fan</u> and <u>ran</u> are introduced;

2. <u>the teacher teaches the children to blend without pausing between letters</u>. The child is taught the convention that one sound is held until the next one is produced. When the child attempts to sound out the word <u>ran</u>, he says, "rrraaannn." In this unblended word there are no pauses; there are no extra sounds. Its relationship to <u>ran</u> is therefore quite obvious.

After the child has learned to process simple two-letter and three-letter "words" composed of continuous-sound letters, the child is introduced to words that contain stop sounds. The stop sounds are first introduced <u>at the end of three-sound words</u>--<u>rat</u>, <u>rag</u>, <u>rab</u>.

The stop sounds are then moved to the beginning. To

demonstrate how they work, the teacher begins a series of familiar endings, such as:

an

an

an

She introduces familiar continuous-sound beginnings:

fan

ran

man

She then erases these beginnings and introduces stop-sound beginnings:

can

can

gan

tan

Before attacking a word she calls attention to the vowel. "What does this say? Yes. ă. So this word is că--n." By calling attention to the vowel, the teacher allows the child to produce the sounds of the first and second letter together "că," thereby eliminating some of the difficulties associated with stop-sounds.

The conventions introduced to demonstrate blending make a significant difference in the performance of the children.

The teacher next introduces a long-vowel convention. A long line drawn over a vowel changes the sound to the letter names, ā, ē, ī, ō, and ū. The teacher proceeds quickly to exercises in which the children first sound out and identify

a familiar word, such as rat. The teacher then draws a line over the vowel (rāt) and the children sound out the new word (rate).

The children now have a large enough repertoire of sounds to begin reading small stories. Initially, the teacher avoids any of the vowel sounds that have not been introduced (such as the vowel sounds in the words all, foil, etc.) and she avoids such combinations as th and ch.

She limits herself to those sounds the child has learned and she spells all words phonetically. For example, she spells the word said, sed, and the word have, hav. Here is an example of the kind of story the teacher might introduce.

A cat līks mĕt.

Hē ētş mēt and he runs.

Hē has fun.

These stories familiarize the children with the conventions involved in moving from one line of text to the next.

The teacher then introduces new sound combinations--th, ch, oo, ee, oi, oy--and expands the scope of her stories.

The final step, which is actually taken in gradual stages, starting when the children begin reading stories, is to introduce irregularly spelled words. These are presented as "funny words," that is, words that are spelled a sound at a time, the way any other word is spelled, but words that are pronounced as if they were spelled differently. Handling irregulars in this way is extremely important. The child must

learn that the spelling of words is not arbitrary. The word have is always spelled the same way; however, it is pronounced as if it were spelled differently, without the final e. "It looks like hav-ĕ, but we don't say 'hav-ĕ', we say, 'hav.'" Unless irregulars are handled this way, a certain number of children will abandon any kind of phonetic attack, trying to remember individual words and making wild guesses--such as calling the word have "got."

Some irregular words are introduced early so that the child doesn't get the idea that the reading code is perfectly regular. The initial irregular words the teacher introduces are: he, she, we, me, go so, no. These are presented by erasing the diacritical marks over the vowel. To prompt the children on how to sound out these words, the teacher simply indicates with her finger (drawing an imaginary line over the vowel) that the vowel should be treated as a long vowel.

After the children have become reasonably familiar with the initial set of irregulars, the teacher introduces other common words that are not as neat as the originals: to, want, like, was, were, etc. These are carefully programmed, so that the child receives sufficient exposure on one or two of them every day until these are mastered. Then, the next pair is introduced while the previous pair is continued as a fairly regular schedule.

Implications

The major implication of our work seems to be that children with relatively low mental ages (initially less than four years) can learn to read if the instruction is adequately geared to give them instruction on all of the sub-skills demanded by the complex behavior we call "reading." Furthermore, virtually all children with mental ages of four or over can learn to read. Their progress is relatively slow, but all can progress from one sub-skill to the next until they can read. With the emphasis on sub-skills, the teacher is in a position to know precisely what skills a given child has not learned. She therefore knows which skills to work on. When a child masters a given skill, the teacher can proceed to the next one.

If a child has a mental age of 4-6 years, the chances are overwhelming that he can learn to read, if the instructional program is adequate. Such programs are not commercially available, however, and the teacher of the mentally retarded child is therefore faced with a dilemma. Should she continue to use material that has been proven to be inadequate to teach mentally retarded children to read, or should she wait until programs are commercially available? She should not wait, because the children she is teaching cannot wait. They cannot place themselves in a state of suspended animation for several years, at which time adequate programs will probably be on the market. She must do the best she can. Specially, this means:

1. She should recognize that the most difficult skills the child must learn are not gross "comprehension" or "experiential" skills, but skills in learning how to translate a written word into a series of sound and :tting these sounds together to form a spoken word.

2. She should be extremely sceptical? of published materials that do not concentrate on these skills; she should not use a given method merely because it works on normal children; she should not introduce whole words;

3. She should be cautious about assuming that different children "learn in a different way" and must be treated differently. If the criterion of performance is the same for all children, the steps they must take to arrive at that criterion must be the same; therefore, the instruction should be basically the same, in that it should concentrate on the skills that the children must learn in order to achieve the desired criterion of performance (which is to be able to translate clusters of symbols into words).

4. She should work with i.t.a. if possible, recognizing that the program as published is inadequate, but also recognizing that it provides the children with clean demonstrations of the relationship between sounds and symbols (since one symbol stands for one and only one sound).

5. She should not try to teach all of the symbols, but merely enough of them to allow for word building; she should not initially program stop-sound consonants (b, d, c, g, h, k,

n, t) but only those consonants which can be blended continuously (f, j, l, m, n, r, s).

6. She should introduce word blends early, with the continuous-sound convention.

7. She should simultaneously teach the children the verbal skills of saying words fast, saying words slowly, rhyming, and alliterating:

a. saying-words-fast is a blending task; the teacher says a word such as ta--ble and asks the children to "Say it fast -- table."

b. saying words slowly is an un-blending task in which the teacher says words and asks children to say it slowly, a sound at a time ("Listen: man. Say it slowly--mmmaaannn.")

c. The focus of rhyming should be a task in which the children are assigned an ending; the teacher says various beginnings; the children say the ending and identify the word ("Here are some words that rhyme with table; ta-ble, ra-ble, ma--, ca--, sta-- .")

d. The focus of alliteration should be a task in which the children are assigned a beginning to which the teacher attaches various endings; the children must then identify the word. (Children say "sss." Teacher follows with "and." "What word is that?" Children say, "ssss." Teachers follows with "eee." "What word is that?"

8. She should introduce stop sound only after the children have learned to handle continuous-sound blends.

9. She should introduce irregulars very cautiously (but relatively early); she should treat these as "funny words," pointing out that they are sounded out in the same way other words are, but that we don't pronounce them that way.

Teaching reading to children with low mental ages is not easy because these children must learn a great deal before they can hope to read. Their progress is slow, much slower than that of children with higher mental ages. But they can be taught, and they should be taught if the aim of education is to educate. There is nothing unique about the problems encountered by mentally handicapped children. The problems are the same as those encountered by any child with a relatively low mental age. To read, all children must learn the set of skills. The child with a higher mental age has already been taught many of these before he steps into the classroom. By focusing on these skills and forgetting about such empty labels as "dyslexia" and "perceptually handicapped" a teacher can succeed with children who have MA's of four or over. The secret of success is simply to provide the children with adequate instruction.